yourYukon Archive of Columns

Columns may be reprinted with permission.
Please contact youryukon@taiga.net.

Column 461

ANCIENT BEAVER DAM RECORDS BEAVER BUILDING TECHNIQUES

by Claire Eamer

Fossilized bones are fairly common, but how about fossilized behaviour?

Yukon government paleontologist Paul Matheus thinks that's just what he might have found along the Old Crow River last summer.

As part of a joint project of the Yukon government and the Vuntut Gwitchin First Nation (VGFN), Matheus and some colleagues were surveying a number of well-known sites where ancient bones have been found in the Old Crow area.

Ancient beaver seem to have used this mammoth bone to help stabilize their dam.

(photo: Paul Matheus/Government of Yukon)

Matheus and his companions, VGFN student assistant Keith Rispin and Natalia Rybczynski from the Canadian Museum of Nature, were checking out a gravel bar where bones routinely wash up when they spotted a pyramid-shaped structure in the eroding bank of the river.

The structure, about four metres across at the base, was made of cut sticks, interleaved with layers of mud. Matheus was sure that they were looking at a beaver dam that had been buried in sediment.

And it's old. The sediment layers surrounding the dam indicate that it is likely 100,000 to 125,000 years old.

2008-02837/

"We're almost certain it's a dam," Matheus says. "If you took a cross-section of a beaver dam, this thing's perfect."

Scientists don't like to commit themselves beyond "almost certain" unless they've seen the object in use, he says. But all the evidence so far says it's a beaver dam.

Part of the evidence is sticks the trio pulled out of the dam. One stick in seven had marks of beaver teeth on it, and some of the sticks that broke might have had teeth marks on the buried ends.

Rybczynski is an expert on ancient and fossil beavers, so she has taken the tooth-marked sticks back to her lab in Ottawa to analyze.

More evidence came in the form of a mammoth bone, about the size of a deflated soccer ball, found lodged near the base of the dam.

Modern beaver often use rocks about the same size to add stability to their dams, Matheus says, but rocks wouldn't have been an option for the ancient beavers of the northern Yukon.

"There are no rocks in this part of the river system, so if you wanted a rock, a mammoth bone is the nearest equivalent."

Finding the mammoth bone used in this way has him particularly excited. He calls it "fossilized behaviour" -- evidence, locked in the frozen sediments of the Old Crow River basin, of how beaver behaved more than 100,000 years ago.

To determine how much the ancient dam resembles modern dams, Matheus hopes to take a close look at a recent beaver dam this summer. There's a suitable dam in the Finlayson area, he says, that was left high and dry a few years ago after it sprung a leak and washed out a section of road.

Matheus wants to dissect the Finlayson dam to determine exactly how it was built.

"Apparently no one has ever done the forensics on a beaver dam before."

Then he'll look again at the Old Crow structure, trying to think of all possible explanations for it, even though all the evidence so far indicates that it's a beaver dam.

"That's what we're always doing -- testing what we see in the fossils, in the bone record."

If, as it appears, beaver have been building dams in the same way for hundreds of millennia, the Old Crow dam might provide an indication of how much of the dam-building process is "hard-wired" into their brains, an inherited rather than a learned behaviour, Matheus says.

"We know that any behaviour has a hard-wired and a learned component. It's a question of how much of each."

Some more beaver-gnawed sticks found further downstream, on the Porcupine River, might extend our knowledge of beaver behaviour back even further in time. Matheus thinks the sticks might be as much as three to five million years old, which would make them the oldest beaver-cut wood in the world.

Information about ancient beaver behaviour could tell us a lot about what drives modern beaver behaviour -- ethology, as scientists call it -- and how easily beaver can adapt their behaviour to changing conditions. And that, in turn, can provide clues about the nature of the behaviour of other animals, including humans.

"Getting at the ethology of animals in the past is pretty exciting," Matheus says.

Environment Canada
Pacific and Yukon Region